WHAT IS CLAIMED IS:

1. An apparatus for measuring and compensating propagation delay between a main base station and a remote base station according to a synchronous digital hierarchy (SDH) standard, the main base station being connected to the remote base station by an optical cable, the apparatus comprising:

an SDH processing unit for inserting a test pattern into an overhead part of an SDH frame to transmit the SDH frame to the remote base station and for receiving the SDH frame looped back by the remote base station to detect at least one frame alignment word (FAW) from the SDH frame of the remote base station;

a controller for producing a value of propagation delay between the main base station and the remote base station by adding propagation delay measured according to a count value of round trip delay of the SDH frame containing the test pattern to a delay error calculated from detection information of the FAW; and

a modulator and demodulator (MODEM) for compensating propagation delay of a baseband signal to be transmitted to the remote base station in response to the propagation delay value produced by the controller.

2. The apparatus as set forth in claim 1, wherein the SDH processing unit comprises:

a test pattern inserter for inserting the test pattern into the SDH frame to be transmitted to the remote base station every predetermined frame period;

a test pattern searcher for searching the test pattern from the SDH frame received from the remote base station every predetermined frame period;

a delay counter being started when the test pattern is inserted and being stopped when the test pattern is searched, the delay counter outputting, to the controller, the count value corresponding to the round trip delay of the SDH frame containing the test pattern; and

an FAW detector for detecting the FAW from the received SDH frame and outputting position information of the detected FAW to the controller.

3. The apparatus as set forth in claim 2, wherein the FAW detector comprises:

a data register for shifting data received from the remote base station by one bit and storing the shifted data in a plurality of internal modules having a predetermined size; and

a synchronous pattern detector for comparing the data stored in the modules with a predetermined FAW pattern and outputting, to the controller, position information of a corresponding module having matched data if the data matches the predetermined FAW pattern.

4. The apparatus as set forth in claim 1, wherein the MODEM compensates the propagation delay of the baseband signal in a time unit of a chip duration.

5. The apparatus as set forth in claim 4, wherein the MODEM transmits the baseband signal early by a predetermined chip time more than the produced propagation delay value.

6. The apparatus as set forth in claim 1, wherein the controller provides information of the produced propagation delay value to the remote base station so that the remote base station can compensate the produced propagation delay value in a time unit less than one chip duration.

7. An apparatus for measuring and compensating propagation delay between a main base station and a remote base station according to a synchronous digital hierarchy (SDH) standard, the main base station being connected to the remote base station by an optical cable, the apparatus comprising:

a controller for receiving propagation delay information indicating a propagation delay value from the main base station through the optical cable; and

a radio frequency (RF) processing unit for converting a baseband signal received from the main base station into an intermediate frequency (IF) signal, compensating for propagation delay of the intermediate (IF) signal in a time unit less than one chip duration

according to the received propagation delay information, converting the compensated IF signal into an RF signal, and radiating the RF signal through an antenna.

8. The apparatus as set forth in claim 7, wherein the RF processing unit compensates for delay based upon the time unit less than one chip duration except delay based upon a time unit of a chip duration compensated by the main base station according to the propagation delay value.

9. The apparatus as set forth in claim 7, wherein the RF processing unit comprises:

a finite impulse response (FIR) filter for performing oversampling and phase equalization of the baseband signal;

an interpolator for interpolating an output of the FIR filter according to a predetermined interpolation ratio and delaying a result of the interpolation by a predetermined time according to the propagation delay information to perform an output operation;

a frequency converter for converting an output of the interpolator into data of an IF band;

a digital/analog (D/A) converter for converting the data of the IF band into an analog signal;

an RF transmitter for converting the analog signal into a signal of an RF band; and

a transmit antenna front end unit for radiating the RF signal through an antenna.

10. The apparatus as set forth in claim 9, wherein the interpolator subtracts, from one chip duration, a delay value based upon the time unit less than one chip duration except delay based upon a time unit of a chip duration compensated by the main base station according to the propagation delay value, and delays the output of the FIR filter by a result of the subtraction.

11. A method for measuring and compensating propagation delay between a main base station and a remote base station according to a synchronous digital hierarchy (SDH)

standard, the main base station being connected to the remote base station by an optical cable, the method comprising:

inserting a test pattern into an overhead part of an SDH frame to transmit the SDH frame to the remote base station and receiving the SDH frame looped back by the remote base station;

detecting at least one frame alignment word (FAW) from the SDH frame;

producing a value of propagation delay between the main base station and the remote base station by adding propagation delay measured according to a count value of round trip delay of the SDH frame containing the test pattern to a delay error calculated from detection information of the FAW; and

compensating for propagation delay of a baseband signal to be transmitted to the remote base station in response to the propagation delay value produced by a controller.

12. The method as set forth in claim 11, wherein the step of inserting the test pattern comprises:

inserting the test pattern into the overhead part of the SDH frame to be transmitted to the remote base station every predetermined frame period.

13. The method as set forth in claim 11, wherein the step of detecting the FAW comprises:

searching the test pattern from the SDH frame received from the remote base station every predetermined frame period;

starting a delay counter when the test pattern is inserted, stopping the delay counter when the test pattern is searched, and outputting, to the controller, the count value corresponding to the round trip delay of the SDH frame containing the test pattern; and

detecting the FAW from the received SDH frame and outputting position information of the detected FAW.

14. The method as set forth in claim 13, wherein the step of outputting the position information of the detected FAW comprises:

shifting data received from the remote base station by one bit;

storing the shifted data in a plurality of internal modules having a predetermined size;

comparing the data stored in the modules with a predetermined FAW pattern and outputting, to the controller, position information of a corresponding module having matched data if the data matches the predetermined FAW pattern.

15. The method as set forth in claim 11, wherein the step of compensating the propagation delay of the baseband signal comprises:

compensating for the propagation delay of the baseband signal using a time unit of a chip duration.

16. The method as set forth in claim 15, wherein the step of compensating the propagation delay of the baseband signal comprises:

transmitting the baseband signal early by predetermined chip durations more than the produced propagation delay value.

17. A method for compensating propagation delay between a main base station and a remote base station according to a synchronous digital hierarchy (SDH) standard, the main base station being connected to the remote base station by an optical cable, the method comprising:

receiving propagation delay information indicating a propagation delay value from the main base station through the optical cable;

converting a baseband signal received from the main base station into an intermediate frequency (IF) signal, and compensating for propagation delay of the IF signal using a time unit less than one chip duration according to the received propagation delay information; and

converting the compensated IF signal into an RF signal and radiating the RF signal through an antenna.

18. The method as set forth in claim 17, wherein the step of compensating for the propagation delay in the time unit less than one chip duration comprises:

compensating delay based upon the time unit less than one chip duration except delay based upon a time unit of a chip duration compensated by the main base station according to the propagation delay value.

19. The method as set forth in claim 17, wherein the step of compensating for the propagation delay in the time unit less than one chip duration comprises:

subtracting, from one chip duration, a delay value based upon the time unit less than one chip duration except delay based upon a time unit of a chip duration compensated by the main base station according to the propagation delay value; and

delaying an output of a finite impulse response (FIR) filter by a result of the subtraction.